Space Weather Forecast

Issued on Thursday, 10 March 2022 at 01:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1 Minor Geomagnetic Storms day 1 and 2 (10th/11th). Chance of Moderate class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low over the period, with activity confined to just a couple of small common class from an elongated sunspot region of small spots in the northeast. There are a total of six sunspot regions on the Earth-facing disc, with the main other regions of note being a pair of small bipolar regions in the southwest, and a larger but inactive region in the southern central disc. No Earth-directed coronal mass ejections (CMEs) were observed.

Solar Wind / Geomagnetic Activity: The solar wind was at background to slightly elevated, with speeds around 380-410 km/s. The magnetic field carried by the wind was weak, while the north-south was predominantly negative (southward pointing) but also very weak. The corresponding geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low with further Common class flares, and a chance of rising to Moderate due to the occurrence of any Moderate class flares. The main risk is likely to be from the region in the northeast, but cannot be ruled out from the other sunspot regions of note.

Solar Wind / Geomagnetic Activity: There are two CMEs en-route with a potentially Earth-directed component, but with low confidence and with the potential for these combining into a single arrival. Any arrival that occurs is currently expected on the 10th with ongoing influence during the 11th. Otherwise solar winds are expected to persist at background to slightly elevated levels. Mainly Quiet geomagnetic activity is forecast. This potentially becoming Unsettled to Active, with a chance of G1/Minor Storm intervals with any CME arrivals at Earth, most likely occurring on day 1 (10th), with ongoing affects day 2 (11th). Quiet conditions then returning day 3 (12th) onward.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at Background with no solar radiation storms occurring. However there is a slight chance that any notable flares from the sunspot regions could increase the observed rate slightly above background.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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